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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------|------------------|
| 09/819,621 | 03/29/2001 | Kenji Todori | P 280037 T7K0-00S105-1 | 4396 |
| 909 | 7590 | 04/13/2004 | EXAMINER | |
| PILLSBURY WINTHROP, LLP P.O. BOX 10500 MCLEAN, VA 22102 | | | ANGEBRANNNDT, MARTIN J | |
| | | ART UNIT | PAPER NUMBER | |
| | | 1756 | | |

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|----------------------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/819,621 | TODORI ET AL. |
| | Examiner Martin J Angebranndt | Art Unit 1756 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 02 February 2004.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5,7-14,16-19,21-24 and 26-28 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-5,7-14,16-19,21-24 and 26-28 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

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1. The response provided by the applicant has been read and given careful consideration.

Responses to the arguments are presented after the first rejection to which the argument is directed. Rejection of the previous office action not repeated below are withdrawn based upon the arguments and amendments of the applicant.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5,7-14,16-19,21-24 and 26-28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Iida et al. EP 0580346, in view of Murray et al., "synthesis and

Charachotization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites",

JACS, Vol. 115(19) pp. 8706-8715 (1993) and Liz-Marzan, et al. WO 99/291934.

Iida et al. EP 0580346 teaches a high density optical disk with a shutter layer of semiconductor particles dispersed in a glass or polymeric matrix over coated with a reflective layer as shown in figure 2. Useful semiconductor materials in amounts of 1-80 mol % and having sizes of 0.1 to 50 nm are disclosed. (3/11-33) The use of polymers as the matrix materials, including PMMA, polycarbonate, polystyrenes, polyolefins, and epoxies is disclosed as its the formation of the layer from a solvent based solution. (3/34-41 and 4/3-13). The reflective layer may be various metals including Ag, Au, Al and Cu. (4/44-51). The use of protective layer is also disclosed. (4/52-57). Another embodiment is shown in figure 3.

Murray et al., "synthesis and Charachotization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993), teaches the

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synthesis of nanocrystalline semiconductor particles to reduce polydispersity and improve the uniformity of surface derivitazation (capping). (page8706, right column) The ease of dispersal in various solvents (alkanes, aromatrics, long chain alcohols, etc) is disclosed. (page 8707, left column). The use of these in optical field is disclosed. (page 8706, left column) The sizes of the particles is between 1.5 and 11.5 nm (page 8707, left column). The surface derivatization is disclosed as preventing flocculation (page 8708, right column). The particles sizes as disclosed as affecting the absorption properties as shown in figure 3.

Liz-Marzan, et al. WO 99/291934 teaches methods for stabilizing particles to prevent agglomeration/coalescence without affecting their properties.(2/16-22). The ligands which bond to the surface of the particles may be thiols, amines, phosphines, phosphates, borates, carboxylates, silicates, siloxy, ... (3/10-28). The stabilization of CdS and other semiconducor materials, having sizes of less than 100 nm, preferably less than 40 nm is disclosed. (7/24-8/17 and examples) The use of this technique for stabilizing the particles for optical uses in a variety of matrices, including polymers, is disclosed. (13/18-23).

It would have been obvious to one skilled in the art to modify the article of Iida et al. EP 0580346 by using the processes of either Murray et al., "synthesis and Charachotization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993) with a reasonable expectation of gaining in monodispersity and stability in both solvents and the polymeric matrix based upon the teachings of Murray et al., "synthesis and Charachotization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993) and Liz-Marzan, et al. WO 99/291934 of the

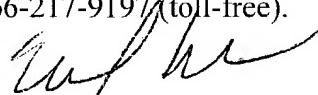
desirability of stabilizing the particles in either solvents or polymeric matrices and the disclosure of the dispersion of these particles in the polymeric matrix by Iida et al. (3/15-20).

The applicant's response indicated that additional data with respect to examples 2A-F of the specification, which could identify and unobvious advantage/benefit of the surface derivatization process. As this office action is non-final, the applicant is free to submit this at this time and is encouraged to do so.

4 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197(toll-free).



Martin J Angebranndt
Primary Examiner
Art Unit 1756